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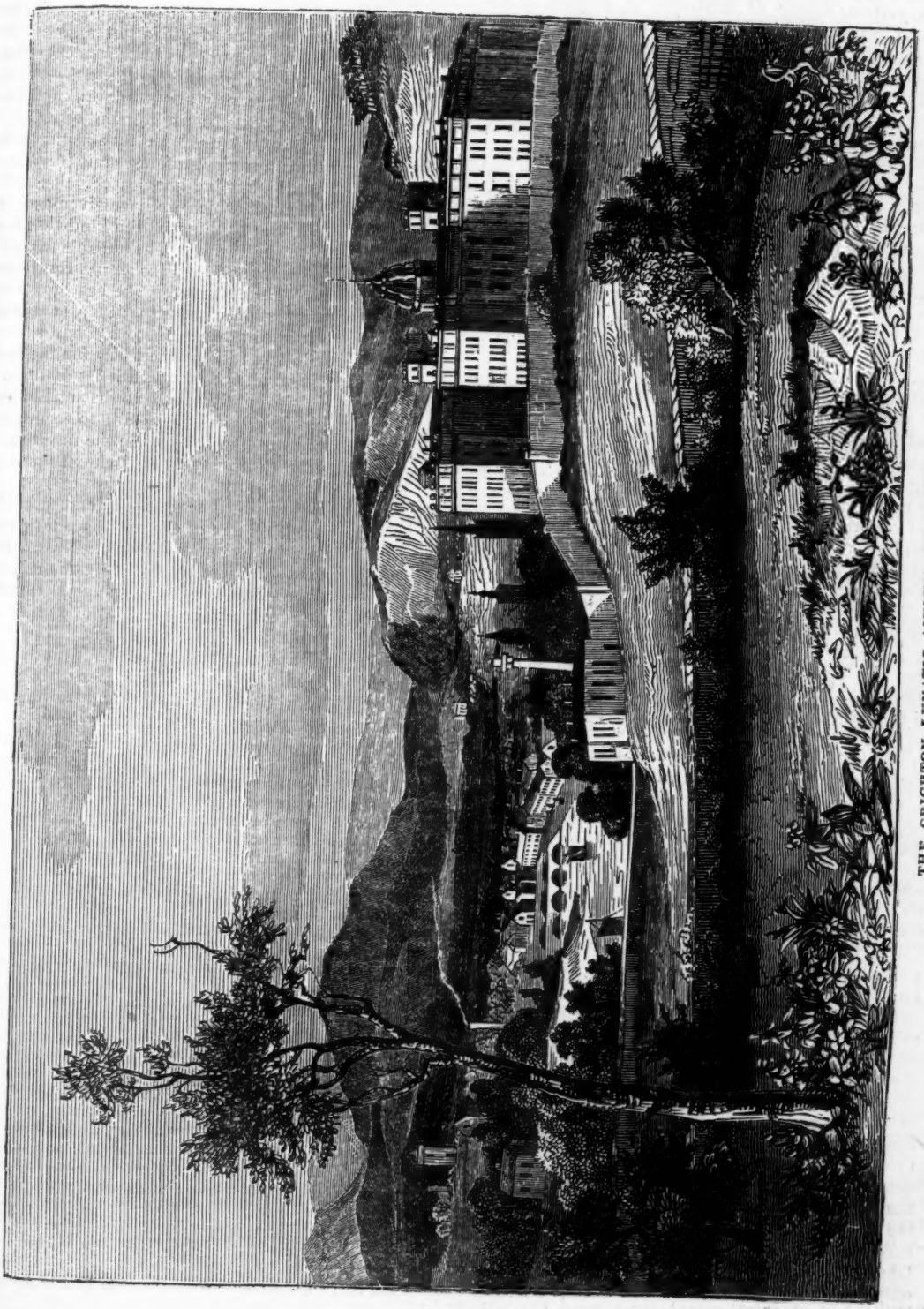


THE CRICHTON LUNATIC ASYLUM, DUMFRIES.

THE CRICHTON INSTITUTION FOR LUNATICS,

AT DUMFRIES, IN THE SOUTH OF SCOTLAND.

THE human mind is a noble, and, in many respects, a fearful subject of contemplation. It is noble when we consider it with respect to its vast power; its resources almost infinite; its mysterious nature; its tangible, but no less mysterious dwelling-place; and the inexplicable collection of causes which produce so endless a variety of effects.

A certain degree of solemnity is necessarily attached to those subjects so far removed from our understanding; a large amount of veneration also is due to that power within us, which we are unable to define, still less to explain, a power which is the gift of that Almighty Being who made man after his own image. Thus, the contemplation of the human mind forms a noble subject of study; but, when we come to consider man as a being subject to stormy passions and fearful propensities; subject to wanderings and irregularities; capable of perpetuating evil, and illustrating all the endless varieties of sin, he is then presented to us, as a being entirely dependent on a higher power, for all that renders life good and desirable.

Whatever may be the causes which produce mental phenomena in the human species, we are reminded not only of vast and wondrous powers, but also of sad and deplorable weaknesses. To behold the mind of such a man as the estimable Cowper, delighting and instructing his own age and succeeding ages, and confirming the wise, strengthening the weak, reproving the foolish, and admonishing the simple—a mind so rich, and apparently so powerful, and yet its owner the victim of mental disease, we cannot suppress an involuntary shudder when we think and know that "the ills man's flesh is heir to," extend their dominion even as far as the mind.

We have been long engaged in the pleasant task of offering to our readers much information on a variety of subjects of study and inquiry, wherein we have seen the operation of the mind of man in all its strength. We have also, on two occasions, referred to the human mind, in a state of weakness and debility, under the pressure of the most dreadful disease to which humanity is subject. By referring to the *Saturday Magazine*, Vol. I., p. 103, and Vol. XIII., p. 45, the reader will find several details respecting two noble institutions for the relief of the insane; viz., THE MIDDLESEX LUNATIC ASYLUM and the LINCOLN ASYLUM. We now propose to call the reader's attention to an institution no less noble in its objects nor less extensive in its useful effects than the two institutions before referred to; viz., THE CRICHTON INSTITUTION for Lunatics, at Dumfries, a view of which forms the frontispiece to the present number.

More than thirty years ago, a few sound-thinking men, supported by the then general feeling of the legislature to attend to the wants of their fellow-creatures, and to alleviate the sufferings of humanity, caused a law to be passed to *allow* (it was not believed it could ever be necessary to *compel*) the magistrates of every county in England and Wales, to build by assessment, a suitable asylum for the care and proper treatment of the insane poor of this kingdom. We have on former occasions alluded to the slow progress which, during these years, has been made in carrying this law into effect; and although late satistical researches have shown that insanity, not only among the poor, but equally among the rich, has increased to an extent far bevond the proportional increase of our population, and prevails to a degree which it is melancholy to contemplate; still, unless it be where individuals speculate for gain, and the confinement of the lunatic has become a mere business concern, we have yet but few establishments in England that are truly deserving of praise. Even some of our best-constructed county establishments are marred in their management, and we fear that too often ignorance of the true principles of treatment, prejudice, and even party feelings, have misdirected the efforts of very amiable men, and led to confusion and irregularities, which, it is probable, will be very difficult to eradicate. There is one splendid exception, but we regret to say, it is not among our county establishments, where improvement has progressed with the knowledge of the age—where chains and manacles are now altogether unknown—where the lunatic is treated as a human being, and where, if he cannot be cured, he is affectionately cared for, the "rooted sorrows of his brain" soothed into tranquillity, and his mind has peace*.

The Establishment of which we have given a view, promises to surpass everything of the kind that has yet been established in Europe. The amiable founder having had at her command funds so ample, that, with the approbation of her co-trustees, she has been able to adopt every suggestion which experience, (not only in this, but in every country in Europe,) has shown to be useful, or in any respect necessary for the successful treatment of all the many varieties of mental aberration, which a charity such as that at Lincoln could not accomplish; and above all, to secure the services of physicians who have made the nature and treatment of insanity the study of their whole lives. The beauty of the scenery may be guessed at from the view we have been enabled to give. It embraces the whole basin or vale of one of the most romantic and beautiful streams in Scotland—the river Nith. The town of Dumfries, emphatically styled by the Scotch, "the Queen of the South," stretches along the banks of this river, immediately at the foot of the rising ground on which the Institution is built. The Solway Frith and the Cumberland and Westmoreland mountains bound the southern horizon, while the hills of Galloway, Crawford Moor, and Annandale, encircle the view on the west, north, and east.

The Crichton Institution, says the statement of its directors, unites all the advantages of a public and a private Asylum. It has been founded and endowed by Mrs. ELIZABETH CRICHTON, widow of the late JAMES CRICHTON, of Friars' Carse, in the county of Dumfries, Esq., from funds left by him, at her sole disposal, for such charitable purposes as a majority of his Trustees should approve of, under the government of a Board of Directors, who may be regarded as responsible, not only for the due administration of the funds, but that the best and most approved systems of treatment shall be pursued. The internal arrangements, and the means of restoring the insane to reason—or, if that be impossible, to greater tranquillity and happiness than can be secured to them elsewhere—have been confided to Medical and other Officers, whom the Trustees have selected on account of their high characters and great experience, whose reputation depends upon the amount of benefit they have in their power to confer, and whose interest it is to render the proportion of recoveries as great as possible. Besides this guarantee, that every exertion will be made which art, or experience, or humanity, may suggest, the Rules have been so framed that, while all publicity will be given to the treatment employed, the strictest secrecy will be observed as to the persons who are treated. The position of the Asylum, the ample provision for the reception of Patients belonging to the higher ranks, and the class of attendants engaged, still further assimilate it to the most eligibly placed, and judiciously regulated, private establishments.

* See HILL'S *Lecture to the Governors of the Lincoln Asylum*, an establishment already noticed in our pages.

The great principles upon which this Institution will be conducted are justice, benevolence, and occupation; and by the application of these, the Patients, in so far as is consistent with their condition, will be induced to regard the Asylum as a home, and those to whose care they are confided as friends and companions. The Resident Medical Officer and Matron will associate constantly with the Patients; direct their pursuits and employments; suggest and join in their amusements; conciliating their affections, and obtaining their confidence, by treating them on rational and enlightened principles; by undeviating kindness, and by a scrupulous attention to the gratification of all their desires, whenever these are compatible with, or conducive to, health and tranquillity. They are intrusted, according to their experience, and to the state and stage of the disease, with the care of one, four, or ten Patients, whom they are not permitted to leave for a single moment, and whom they are enjoined to soothe, encourage, amuse, or employ; their presence and personal attentions rendering restraint, to a great degree, if not altogether, unnecessary. Whenever coercion is unavoidable, solitary confinement, in padded rooms, is resorted to, in preference to any of the other modes of physical restraint, which have been so long in use, as being of a more depressing and less irritating character, and in no way interfering with the perfect performance of all the bodily functions.

Divine service will be performed twice every Sabbath; and where the condition of individuals may render it inexpedient for them to join in a public ordinance, religious consolation will be administered in private.

The internal arrangements, and the means of restoring the insane to reason, (or, if that be impossible, to greater tranquillity and happiness,) have been confided to medical and other officers, among whom we find the name of Sir Andrew Halliday, K. H., a gentleman distinguished by his truly kind and benevolent disposition, united to a profound and scientific knowledge of his profession, and more particularly of that part of it which relates to the diseases of the mind.

THE LAND OF BEAUTY.

"A world, where there falls no blight!"—Mrs. Hemans.

There's beauty in the earth:
When spring its verdant mantle spreads;
And starting from their incense beds
The joyous flowers all round are seen,
Spangling, like gems, the robe of green
That earth now wears—when bursting free
The buds of hope adorn the tree,
And echoing with the wild-bird's song
The leafy woods resound along!
There's beauty in the earth!

There's beauty in the deep:
When milder than the soft repose
That steals from weary man his woes;
And brighter than the sunny glade
Its waters calm in peace are laid:
Or glittering in the golden ray
Of setting sun they sportive play,
And sparkling leap unto the sky
As though their joy they'd testify—
There's beauty in the deep!

There's beauty in the sun:
When full in glory's might he sheds
His lordly splendour o'er our heads,
And glowing with meridian light
Defies the glance of mortal sight;
Or now when in the lovely eve
Of summer's day his glories leave,
And sinking slowly to his rest
He seeks the mildness of the west—
There's beauty in the sun!

There's beauty in the sky:
When silent in the hour of night
The moon pours forth her silvery light,
And heaven, a sheet of tinted blue,
Is brighter than the sapphire's hue;
And stars unnumbered shine above,
Like angel ministers of love
Regarding with a thousand eyes
Man and his wayward destinies—
There's beauty in the sky!

* * * *

The beauty of the earth
Is seen but short—and blushing spring
Departs with early-flying wing;
The lovely flow'rets sink in death
Before the winter's icy breath;
The bud and blossom fall away
And fade, and fret, in slow decay,
And silent soon the woods become,
The song of harmony unknown—
What beauty in the earth?

The beauty of the deep:
Alas! how treach'rous is that rest,
Which now is spread on ocean's breast;
As though the placid-smiling sea
Could never falsely traitor be;
When swelling with its angry roar
The hapless bark it washeth o'er;
And far below in coral cave
The white bones find an ocean grave—
What beauty in the deep?

The beauty of the sun:
At noon-tide heat we shun his ray,
Burning and blasting with decay
The choicest flower—the brightest gem
That shines in earth's fair diadem;
At eve we see his parting beam,
How pale! how chilling it doth seem!
Like words, when charity's forgot,
It shineth but it warmeth not—
What beauty in the sun?

The beauty of the sky:
Not even *this* can satisfy,
The grandeur of the vaulted sky;
For threat'ning shower, and murky cloud,
And wrathful storm, and thunder loud,
Their fury raise and snatch from view
The glories of its brilliant hue;
And though we strain each eager eye,
We can but clouds and mists descry—
What beauty in the sky?

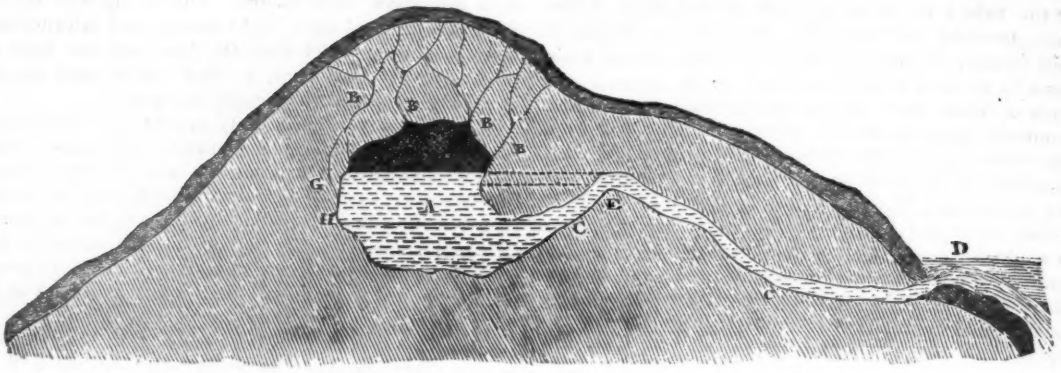
Where then is beauty found?
There is another country, where
The bloom excels the brightest here;
The waters, purer far than those
Which evening-dew hides in the rose;
The sun ne'er sets, nor fainter shines—
The glory fades not—nor declines
The fragrance of that heavenly shore,
Its joys—its bliss for evermore.
Here! here is beauty found!

Youghal, Ireland. S. H.

Learn to feel the supreme interest of the discipline of the mind;—study the remarkable power which you can exercise over its habits of attention and its trains of thought; and cultivate a sense of the deep importance of exercising this power according to the principles of wisdom and of virtue. * * * * Judging upon these principles, we are taught to feel that life has a value beyond the mere acquirement of knowledge, and the mere prosecution of our own happiness. This value is found in those nobler pursuits which qualify us for promoting the good of others, and in those acquirements by which we learn to become masters of ourselves. It is to cultivate the intellectual part for the attainment of truth,—and to train the moral being for the solemn purposes of life, when life is viewed in its relation to a life which is to come.—Abercromby.

The South American Indians are extremely hospitable, and I was delighted to see the readiness with which food and drink was offered to the stranger. An Indian visiter, naked and armed for the chase, on coming into a hut, says to the man dozing in his hammock, and who may never have have seen him before, "Prooha meroo," (I am come,) to which the other replies deliberately, "Cherre," (sit down,) and no other introduction is required, but food and lodging immediately tendered.—Capt. Alexander.

INTERMITTING SPRINGS.



SECTION OF AN INTERMITTING SPRING.

THERE are some springs, which flow copiously in winter or wet weather, while in summer or dry weather, they partially or entirely cease; others, on the contrary, flow during the driest weather, and ebb when there is much rain; and some springs there are, which have periodical ebbs and flows, apparently unconnected with the weather or seasons, but always occurring at regular intervals, sometimes of a few seconds only, and at other times of as many weeks. In some cases of the last kind, the increase of the water is quite certain and regular; while in others, it is so irregular and uncertain, that it is impossible to foretell when such springs will begin or cease flowing. All these kinds of phenomena are called *intermitting** springs: but, perhaps, this term is strictly confined to those springs which flow for a while, and then cease; then flow again, and so on; for those which are always flowing, but have a periodical swell or increase, are more properly named *variable* springs.

Before we inquire into the causes of intermitting and variable springs, the reader must be made acquainted with the reasoning by which the phenomena of springs, generally, are now accounted for. When we consider the large number of rivers in the world, and the immense quantity of water poured into the sea by every one, the most insignificant of these rivers; and that all this water comes out of the ground by springs; the question naturally arises, whence does this water originally proceed? What keeps the spring always supplied?—Again, another question occurs;—what becomes of this water after it enters the ocean, which certainly manifests no increase in consequence of the immense volumes of liquid always pouring into it? Now in order to account for both these subjects of wonder, the most easy explanation, and therefore that which first suggests itself to the mind, is obviously that the water finds its way back from the ocean to the springs, just as fast as it flows from the springs to the sea. Thus the water is taken away from the sea, as fast as it enters; so as to prevent either increase or decrease in that body; and this water is returned to the springs to keep them always supplied. Such a conclusion must have occurred to King Solomon, the Sacred Preacher, who says, "All the rivers run into the sea, yet the sea is not full; unto the place from whence the rivers come thither they return again." *Eccles.* 1. 7.

But a body cannot be kept *always* in motion, without some maintaining power; and that which serves in the present instance, to keep up the continual circulation of water, is *the heat of the sun*, which, acting on the surface of the sea, rapidly evaporates the water. This evaporation, in the Mediterranean, is much too rapid to be compensated by the numerous rivers which flow into it; and hence, there is always a strong current coming in from the Atlantic through the straits of Gibraltar, to supply the waste occasioned by evaporation. All this water, raised up in the form of vapour, forms clouds, which are driven along till they arrive at a climate too cold to preserve them in an aëriform state. They then condense into drops, or solid flakes; and being too heavy to be supported in the air, they fall, and constitute rain, hail, or snow. This, after performing its various useful offices, fertilizing the earth and feeding the vegetable world, penetrates into the soil, and descends through various soils and rocks into the bowels of the earth. Here it forms caverns and vast reservoirs for its reception, from whence it flows through subterranean channels, till it issues out at the surface in the form of springs, which, uniting, make the source of the different rivers of the world, which supply to the sea what it loses by evaporation. Thus, the water, with which the earth is stocked, may be compared to the blood of an animal. The ocean is the heart; the clouds are the arteries that carry it out and diffuse it gradually over the earth to discharge all its useful and necessary functions, which are no sooner accomplished, than the brooks and rivers act as veins, and restore it to the ocean. This great reservoir is plentifully stocked with salt, to preserve the great inert mass of water therein from putrefaction; but the showers and springs are destitute of salt, because the *pure* water only is raised up from the sea by heat: all the salt remains behind in the sea, as in a still.

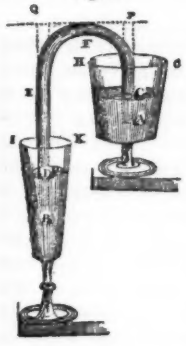
The phenomena of *intermitting* springs were first explained by Dr. Atwell, who was induced to examine into their cause by seeing a curious *variable* spring at Brixam, near Torbay, in Devonshire. The following is the manner in which he accounts for springs, which flow at certain regular periods, and during the intervals are quite dry.

Let the above figure represent the section of a hill or mountain, with its thin covering of vegetable mould, the internal part being composed of chalk, clay, stone, or some other stratified rock, and having a hollow cavern A, which is supplied with water filtering down through the *runners* B B B B, which are crevices or pores in the rock, which receive the rain or snow-water after it has been absorbed by the external soil. The only outlet from this cavity is by the subterraneous passage C E C. Now according to the simplest law of hydrostatics, that *water does not*

* The term *intermitting* implies, according to its derivation from the Latin, that which *leaves off for a while, and then begins again.*

rise above its level, the water cannot run out by the channel C E C, until it has risen in the chamber A to the level of the line G, or level with the lower bend E, of the tube C E C, as seen by the dotted lines. When once, however, the water has attained this height, it will continue to run, till the water in the cistern A has sunk to H, level with the entrance of the pipe C, or to such a depth that the air within the reservoir may communicate with the air without. The process of this reasoning will be understood by those who have seen the operation of the *siphon*, an instrument used for transferring liquids from a large barrel, or other vessel, into a smaller one; or in any other case when it would be inconvenient to move the first vessel. It consists simply of a tube bent into something like the shape of the passage C E C, and having one leg or branch longer than the other; as in the annexed figure. By means of the siphon B F A, the water in the upper vessel may be transferred to the lower. To effect this, the leg, which is inserted in the water to be removed, must be shorter than the other; so that the level of the water in the vessel I K, may be beneath the level of the water in H *c*. The water will thus keep on running from the upper vessel into the lower, as long as the column Q E D is greater than P C. Now, in this case, in order to set the siphon to work, it is necessary that it should be previously filled with water, or if we exhaust the air with the mouth, a vacuum is left in the upper part of the tube. The pressure, therefore, of the atmosphere on the surface of the water in the vessel, is not counteracted by any equal pressure within the tube; and consequently it forces the water up over the bend, when it falls out. As this process is continually repeated, a constant stream is kept up through the siphon, until the water in the vessel has sunk so low, that the lower end of the shorter leg is left uncovered by the water. Of course, the transfer of the water must then cease*. On this principle cups are sometimes made, which hold the water very well until it rises to a certain height, when they at once discharge the whole of their contents. These cups contain a siphon, the opening of whose shorter leg is near the bottom of the cup. When water is poured into such a cup, it cannot run out until it attains a height level with the bend of the siphon. It will then commence running, and continue to do so, till the water has sunk to the mouth of the shorter leg, and the vessel is nearly empty.

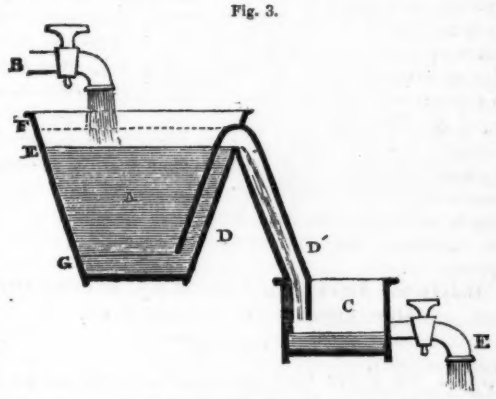
Fig. 2.



Now the *intermitting* spring was said to act *exactly* like this cup; and although the supply from above into the cavern A is gradual and equal, yet the water runs out through the channel C E C only at periodical intervals, and then more quickly than it enters. The passage C E C must, of course, be large enough to carry off the water more rapidly than the runners B B supply it; or else the level of the water in the reservoir A will be always the same, and the spring will not *intermit*, or cease flowing for a while. The length of the intervals will depend on the capacity of the reservoir, or the difference between the levels G and H. Suppose it requires a week for the runners B B B to fill the reservoir from H to G, and that the passage C E C would empty the cavern from G to H in four days, if the runners did not give it any fresh supply; then, when both the filling and emptying passages are in action, the level will sink from G to H in nine days, eight hours. The spring will, therefore, run for nine days, eight hours, and intermit for a week, during which time the level will rise from H to G; it will then begin to flow again, and so on regularly, provided the supply be equal.

It has, however, been lately proved by experiment, that this will not take place, unless both ends of the siphon-channel CEC be immersed in water. It is essential therefore, that, in an intermitting spring, *the mouth at* D *be under water*. The fallacious point in the foregoing process of reasoning is, that we should consider the channel C E C to be *necessarily* a siphon. If the runners B, &c. supply water faster than it is discharged at D, the spring is not of the intermitting kind, and is accounted for at once. If the supply at B correspond with the stream at D, the water will continue to flow in the same uninterrupted and equable manner, as soon as it once turns the lower bend E; and the supply from B cannot fall short of the discharge at D, for the water which flows over E, the lower bend of the channel, must, in these two cases, correspond with that which descends from B. In the two last suppositions, the level of the water must always coincide with the lower dotted line, which runs to E. To prove all this a model has been constructed, which is shown in this figure.

Fig. 3.



A is a tin vessel, representing the cavity from which a spring issues. This is equably supplied with water by the cock B, answering to the runners. The water from this vessel can be discharged into the lower vessel C, by the syphon-tube D D′, which is rather larger than the cock B. Another cock E, equal in size to B, is provided to the vessel C. Now when this cock E is open, the water flows out of it, just as fast as it flows down from B; the level of the water being at E, and just coinciding with the lower bend of the siphon D D′.

The water thus retains its level in A, and just dribbles over the bend of the tube D, uniformly and without interruption, as fast as it is supplied from B. When, however, the cock E is closed, the level of the water in C rises till it covers the mouth of the tube D, and then all the phenomena of intermitting springs are imitated. However equal the supply from B may be, the spring in C ebbs and flows alternately, and the level in A fluctuates between F and G. When this level is descending, the spring flows much more rapidly than the supply at B; and when the level in A is ascending, the spring does not flow at all. The same effects would of course result, if the cock E were left open, but were placed above the level of the mouth of the tube D′.

The exactness with which such a model, when the

* For a fuller account of the properties and uses of the SIPHON, the reader is referred to an article at page 212, Vol. XII., of this work.

cock E is closed, imitates all the phenomena of natural intermitting springs, is truly surprising. Even the bubbles of air which attend the beginning of their flow, are repeated on a small scale with the model, and arise from the air which gets into and fills the siphon D D′, when, at the termination of the flow, its mouth is uncovered by the water in A, which has descended to the level of G. During the rise of the water in A up to F, part of this air is driven out into C; and, if the lower mouth of the siphon be under water, it escapes in bubbles. As soon as the water in A has attained its highest level, the remaining part of this air is driven out, and then the flow re-commences. The water gushes abundantly over the edge of the cup C, and the discharge so greatly exceeds the supply from B, that in less than a minute it empties the vessel A down to the level of G. A fresh supply of air then rushes up into the siphon, which was before full of water; the flow of water from C entirely stops, and does not re-commence until the water in A has again risen to its utmost height F, when the same process is repeated.

The beautiful action of this model, when the lower end of the tube D′ of the siphon is under water, and its entire failure when, by opening the cock E, the mouth is left uncovered by the water, clearly prove that it is essential to all intermitting fountains, that their orifices should be in the bottom of a basin, well, or brook, so as to be always under water: yet this most important and necessary condition was quite unnoticed, or overlooked, till very lately, when MR. WHARTON, of Durham, proved it by this experiment. This gentleman exhibited the model, of which we have given a section, at the last meeting of the British Association: but no account of it, as explanatory of the new theory of intermitting springs, has hitherto been published.

AMERICAN HOTELS, TAVERNS, BOARDING-HOUSES, AND HOUSES OF ENTERTAINMENT.

UNDER the above four heads are classed the whole range of "places of accommodation," throughout the United States of America. Although, in a few instances, the traveller will meet with humble cottages, over the door of which, "cakes and beer," or "cakes and cider," is written in rude and unpretending characters, and not in "letters of gold;" yet these are so few, and of so unpretending an order, that they are never reckoned upon as coming within the general range of places of rest and accommodation for the plodding wayfarer, or for those whom business or pleasure induces to take long journies through the country. In the eastern and middle States, you sometimes meet with the word "Inn," inscribed on a swinging board attached to a tall sign-post by the side of the road; but one might wonder how this should happen, since the inhabitants invariably speak of such "inns" as *taverns*, coupling therewith the name of the occupier, as Green's Tavern, &c., but on no occasion applying the term "inn."

Hotels may be considered as taking precedence of the rest; although, in the principal towns and cities, there are "boarding-houses," where the charges for board and lodging are pretty much upon a par with the charges at a first-rate hotel. Indeed, there seems scarcely any reason why they should not be precisely similar, since the company at both sit down at public tables, where the viands are of the same kind and quality; the only difference being this,—that the hotel-keeper takes out a license to retail wines and spirits, charging thereupon whatever profit he pleases; while the keeper of the boarding-house (being unlicensed) professes to purchase the wines and spirits his "boarders" may wish for, from some neighbouring store, without charging anything for the trouble of so doing. There is not, however, much difference in the prices of liquor and wine, since at any of the *genteel* establishments you will be charged about two dollars (8*s.* 4*d.*) per bottle for port and sherry, for good Madeira three dollars, and for other wines in proportion. Twelve dollars the week is the usual price of the respectable hotels and boarding-houses in the Atlantic cities of the eastern and middle States; in the cities of the southern States, the charges are considerably higher. In the interior of the country, the term Hotel is by no means confined to establishments of the first order; for where the country is *new*, and as yet but thinly inhabited, you frequently see wooden buildings, but partially enclosed with planks or weather-boards,—with old straw hats and bonnets in the holes in the windows where glass ought to be,—and yet some lofty sign-board informs you that it is "The Washington," "The Franklin," or "The Citizen's Hotel."

Since it is the custom in America for the company to assemble at a public table, there necessarily is a very "lengthy" dining-room attached to each of those establishments in populous places. There the "boarders" (for persons remaining but a single day are styled "boarders") assemble three times in the day; and those who indulge in that not very general custom in America, of eating supper, repair a fourth time to a table, where cold joints (the remains of dinner), shell-fish, &c., are paraded from nine to eleven o'clock every evening.

Boarding-houses require no particular description. They are, in fact, nothing more or less than hotels or taverns, without licenses to sell wines and spirits; but where the "boarders" can be supplied with these articles in all their varieties; and whether they are supplied from the "bar" of an establishment, or from some neighbouring store, signifies but little to the guests, provided the articles have price and quality to recommend them, and are at hand in due season.

In consequence of the very common custom amongst the Americans, of sojourning at *private* boarding-houses, there are, comparatively, few hotels or *public* establishments in the towns and cities. Strangers, however, usually resort to the latter on their first arrival; but should they be likely to sojourn for a few weeks, or months, many of them change their quarters, and remove to one of the "private boarding-houses." But many of these establishments have their daily "comers" and "goers," as well as the hotels and taverns; for should you be staying but for a single day, these establishments will willingly receive you and your luggage, provided they be not already full of company. Like the hotels, they have their prices per day, as also by the week; and, according to the style and pretensions of the establishment, you will be charged from three shillings to half a guinea for a day's "board and lodging." In the interior of the country, the charges are much lower, since, in the most respectable establishments the inland towns afford, from three to four dollars (13*s.* to 17*s.*) per week are the customary charges for boarding—lodging, as a matter of course, being included; without any additional tax in the shape of fees to the servants of the establishment.

The next order of *public* establishments is taverns. This includes a great majority of what we should designate country inns and ale-houses. Taverns, like

the hotels, pay a tax to the state; and, consequently, retail such wines and liquors as may appear best suited to their customers. Twenty years ago, scarcely any of the country taverns dealt in malt liquor of any description; cider, and indifferent whiskey, distilled from raw Indian corn or rye, constituted their whole stock in trade. But the case is now altered, and there are very few of these country establishments, having any pretensions to respectability, that do not afford ale or strong beer; and it may be remarked generally, that this beverage is becoming popular amongst the Americans. Establishments of this order possess neither parlours nor coffee-rooms; a large naked room, adjoining the bar, and called the bar-room, is the only place where any drinking goes on; and there it is much after the manner of the English gin-shops. There it is not the custom to sit sotting for hours over a pot of beer, or a glass of liquor; what is called for is drank standing at the bar, and should the parties happen to be of the tippling order, they will seat themselves in some part of the large uncomfortable room, until they feel disposed to indulge in another "drink," when they again approach the bar, and swallow, instanter, that which they call for; being charged so much per "drink," the liquor not being measured out to them; for the bottle or decanter containing the spirits (or wine) is placed by the side of a tumbler, the party being allowed to help himself—to much or to little—for which he is charged the customary price of a "drink."

The country taverns depend more upon the profits arising from the sale of "victuals" than "drink;" for, in the villages in the new settlements, the young men employed in the stores, as well as the journeymen mechanics, and frequently married people too, "board" at the taverns. As for those situated upon the various roads intersecting the country, they are mostly at such distances from the villages, and, also, from each other, that travellers find it both convenient and necessary to partake of some refreshment, or to obtain a lodging for the night. A good and substantial meal will be charged from nine-pence to a shilling, and for a comfortable bed six-pence.

Houses of entertainment yet remain to be spoken of. Few of these have any "outward sign" of affording the weary traveller food or rest. In some instances, however, a piece of chalk or charcoal, applied to a rough board, informs the wayfarer that "hay and oats are sold here;" or, that there is "accommodation for man and horse." The parties who hold out those "public hints," do so, no doubt, with a view of making a profit upon their farm-produce, &c. But there are many that hold out no intimation of being willing to accommodate travellers, whose houses, in process of time, acquire the name of houses of entertainment. These persons usually profess to have opened their houses for the convenience of the public, rather than for their own gain; and yet their charges are precisely the same as those made by the tavern-keepers in the same section of country. Having no license to sell spirits, it is expected that a stranger will be able to subsist upon such "victuals" as the house affords, accompanied, in most cases, with a little indifferent cider. These houses of entertainment are mostly the abodes of farmers of some standing,—of persons who have been able to make their farms yield more than sufficient of the necessaries of life for the maintenance of their families; which is, by no means, a very common case in the recently-inhabited districts of the continent of North America.

HARVEY,

THE DISCOVERER OF THE CIRCULATION OF THE BLOOD.

Few men have rendered such vaiuable service to the human species as Dr. William Harvey, a physician who flourished about two hundred years ago. It was he who fully demonstrated, for the first time, that the blood is in constant circulation, so long as life exists; and by this discovery he gave to the medical practitioner a mighty engine by which to regulate his proceedings, in the event of illness; for it is obvious that the treatment of diseases must be very different on the supposition that the blood circulates, and on that that it is stationary.

William Harvey was born at Folkstone in Kent, on the 1st of April, 1578. He received the rudiments of education at Canterbury, and then went to Caius College, Cambridge. At the age of nineteen, after having devoted six years to scientific study, he went abroad for improvement, and attended the lectures of Fabricius on anatomy, of Minadous on pharmacy, and Casserius on surgery, at Padua. In 1602 he returned to England, and six years afterwards was elected Fellow of the College of Physicians, and Physician to Bartholomew's Hospital. In 1615 he was appointed to read lectures on anatomy and surgery at the college, and began then to develope his views respecting the circulation of the blood.

It appears that the manner in which Harvey was led to the adoption of his opinions, was from the contemplation of certain valves which exist in the veins, and which are so formed that a liquid, such as the blood, could pass through them in one direction, but not in another. Now every one who reflects for a moment on the wonderful and beautiful productions of nature, must be conscious that nothing is created in vain. Everything has its use, according to some wise ordination. Harvey, impressed with these ideas, respecting the works of creation, concluded that the valves in the veins were formed in the manner which has been described, for the purpose of admitting the blood to circulate through them in a particular direction.

Before Harvey's time the most confused and contradictory opinions prevailed as to the functions of the blood. Some thought that it moved from the lungs to the heart along certain air-tubes, and mixed with the air, while others thought that it trickled through minute pores. But Dr. Harvey made attentive observation, both during life and after death, and formed his opinions from a great variety of circumstances. He found that the heart has periods of action and of rest, but that in warm-blooded animals its motions are so rapid, that the different steps of them cannot be distinguished. In cold-blooded animals they are slower. The heart is raised during its action, and the pointed end is turned forwards. It contracts in every direction, especially at the sides. These and many other circumstances, which are too difficult for popular explanation, led him to the promulgation of the opinion that the blood is in constant circulation.

This opinion speedily excited the attention of anatomists in every part of Europe. Primirosius, Parisanus, Riolarius, and other foreign anatomists, violently opposed his opinion. To some of these he replied, but others he left unanswered, from disgust at their violence. During the whole of the contest he behaved with the nobleness which belongs to a man who knows that he is in the right; and by degrees he had the satisfaction of seeing his old enemies, one by one, turn round and embrace his opinions. When it gradually became admitted that the circulation of the blood was the correct theory, his enemies attempted

to deprive him of the honour, by saying that it had been discovered before his time. Some said that it had been discovered by Father Paul, of Venice; others attributed it to a Spanish physician, Servetus, who was afterwards burned for heresy by Calvin; while a third party went so far back as the time of Hippocrates, to find the discoverer. But every succeeding year, and every succeeding advance in science, proved more clearly Harvey's claim to be considered as the real discoverer of the circulation of the blood.

Harvey was appointed Physician Extraordinary to King James the First, and, in 1632, Physician in Ordinary to King Charles, by whom he was much esteemed, and who furnished him with many specimens of animals on which he could make such observations as might further his other investigations. During the civil wars he adhered to the court party, and travelled with the king; and while staying for a short time at Oxford, he was presented by the king with the mastership of Merton College, in the place of Dr. Brent, who had taken the opposite side in politics, and left the university. But when Oxford surrendered to the parliamentarians, Brent resumed his former office, and Harvey retired to the neighbourhood of London.

He then published some anatomical and physiological works, which greatly raised his reputation, already beginning to be appreciated by his researches in the circulation. But his labours were much retarded by the plunder and destruction of his valuable museum, by his political adversaries, while he was in the king's service. This is not the only instance which we have of the destruction of valuable scientific collections, during the heart-burnings of political events.

In 1652 his brother-collegians erected a bust to his honour, in their hall; in return for which he built a library and museum for the college. As old age crept upon him, he was subjected to distressing attacks of the gout, which contributed to imbitter his existence so much, that he is said to have shortened his days with a dose of opium. He lived during the latter years of his life at his country-house at Lambeth, or with his brother near Richmond. He died on the third of June, 1657, in the eightieth year of his age, and was interred at Hempstead in Essex, his funeral being attended by all the fellows of the college to which he belonged. He died in possession of the esteem and respect of his contemporaries, and has secured the admiration of posterity.

We may here give a very brief view of the nature of the circulation of the blood, the great problem which occupied so much of the attention of Dr. Harvey.

The primary machine by which the blood is set into circulation is the heart, and it is conveyed through pipes or conduits, to every part of the body; the pipes becoming smaller or finer, as they ramify towards the extremities of the system. What is the first action that sets the blood into motion is a mysterious question; but when once the motion commences, it proceeds in a regular order. The blood is conveyed from all parts of the body into the right auricle of the heart, through the veins, and from thence it is propelled into another part of the heart, called the *right ventricle*. From the latter position it is conveyed through an artery into the lungs, where it is purified by the action of the atmospheric air which we inhale into the lungs, and rendered fit to perform its functions again. It is then returned from the lungs into the left auricle of the heart; from thence into the left ventricle, and thence again it is sent to perform its circuit throughout the system.

Thus does this wonderful operation go on! The blood affords nourishment to the several parts as it flows along, and collects in its progress the impurities which may be met with in the system. So much is this the case, that when the blood is returned again to the heart, it has acquired quite a purple colour, by the substances, chiefly carbon, which it collects in its progress. When the blood is brought into contact with the air in the lungs, the oxygen of the atmosphere removes the impurities from the blood, and enables it to return to the heart, glowing with its wonted red colour.

It is said that each cavity of the heart contains from two to three ounces of blood; that the heart contracts four thousand times in one hour; and that, therefore, there passes through the heart, every hour, seven hundred pounds' weight, or eight thousand ounces of blood. The whole quantity of blood in a full-grown man is estimated at about twenty-five or thirty pounds; so that a quantity of blood equal to the whole mass in the body must pass through the body twenty-eight times in an hour.

In different individuals, and even in the same individual at different periods, the force of the heart's action, and the activity of the vessels are very various. In people of a low temperament the circulation is languid; in the sanguine it is quick. When hope enlivens, or prosperity encourages the mind, the vital current flows with ease and freedom; but grief or adversity slackens it. In youth the pulse is frequent; in middle age it is firm; in old age, weak.

There is no part of the human body, however remote from the heart, which is not abundantly supplied with blood; and of the minuteness of the vessels through which this blood is conveyed, we may form some conception from the fact, that a prick of the finest needle draws blood! We are not to imagine that there is a cell of blood occupying the middle of the finger, of the arm, or of any other part of the body, merely from the circumstance that a slight puncture so soon causes blood to flow. No: wherever we prick through the skin, we penetrate vessels whose minuteness almost exceeds belief, which vessels are filled with blood. Leuwenhoeck estimated, from microscopical observations, that every square-inch of the human body is traversed by at least one thousand distinct and separate vessels! What must be the minuteness of these exquisite canals! And in the progress of the blood through these minute channels, it deposits matter which conduces to the growth of all the several parts. The blood is the great reservoir from which all the solid parts of the animal frame are gradually formed. Where bone is wanted, it deposits a certain principle or substance which is calculated to produce bone: where muscle is required, a sort of fleshy fibre is left behind the blood in the course of its progress.

How do the works of man sink into insignificance when compared with such exquisite mechanism as that by which the circulation of the blood is carried on! Nothing superfluous—nothing wanting—every organ, and every part of an organ, having its appropriate and defined office, and all working together in harmony to produce one common end! If this is great and wonderful, the discovery of the fact is, and must necessarily be, of importance to man, and for this reason posterity will never cease to owe a debt of gratitude to Dr. William Harvey.

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